

Detector Switch

Low-profile Tri-directional Operation Type

SPVL Series



Flexible and thin 1mm height detector switch with a large operational range of 180 degrees.

Detector

Push

Slide

Rotary

Encoders

Power

Dual-in-line
Package Type

Multi Control
Devices

TACT Switch™

Custom-
Products



Features

- Tri-directional structure (vertical, right and left) provides an operational range of 180°.
- Two-sided sliding-contact point structure for high-contact reliability.
- Reflow solderable.

Applications

- For detecting mechanisms and media in personal digital assistants, IC recorders, silicon audio systems, car AV equipment, digital camcorders and various devices.

Typical Specifications

Items		Specifications
Rating (max.)/(min.) (Resistive load)		1mA 5V DC/50μA 3V DC
Contact resistance (Initial/After operating life)		2 Ω max./5 Ω max.
Operating force		0.35N max.
Operating life	Without load	50,000cycles
	With load	50,000cycles (1mA 5V DC)

Product Line

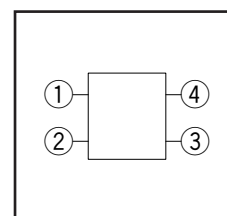
Poles	Positions	Configuration	Location lug	Product No.
1	1	For PC board (Reflow)	With	SPVL110100
			Without	SPVL120100

Dimensions

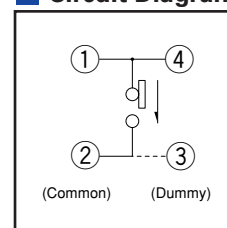
Unit:mm

Style	PC board mounting hole and land dimensions (Viewed from direction A)

Terminal Layout (Viewed from Direction A)



Circuit Diagram



Note

Above dimensions indicate "with Location lug" version.

Refer to **P.68** for product specifications.
Refer to **P.71** for taping package specifications.

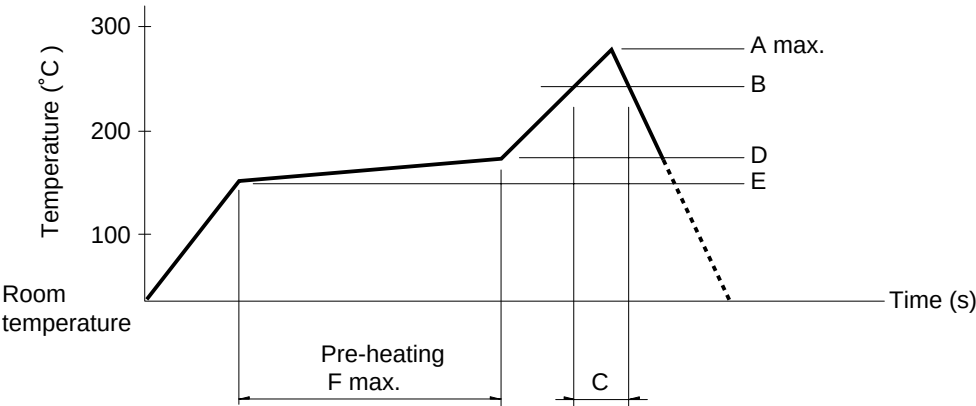
Product Specifications

Series		SPVP	SPVC1	SPVN	SPVS	SPVG	SSCW	SPVQ5	SPVL	SPVQ1	SPVQ3	SPVQ4	SPVQ6	SSCN
Items														
Detector	Operating temperature range	-40°C to +85°C												
	Rating (max.) (Resistive load)	1mA 5V DC	10mA 16V DC	1mA 5V DC	50mA 20V DC	0.1A 12V DC	1mA 5V DC	0.1A 12V DC	1mA 5V DC	0.1A 12V DC	0.1A 12V DC	0.1A 12V DC	0.1A 12V DC	0.1A 12V DC
	Initial contact resistance	5 Ω max.	1 Ω max.	2 Ω max.	500mΩ max.	500mΩ max.	2 Ω max.	500mΩ max.	500mΩ max.	500mΩ max.	500mΩ max.	500mΩ max.	500mΩ max.	500mΩ max.
	Insulation resistance	100MΩ min. 100V DC					100MΩ min. 250V DC	100MΩ min. 500V DC	100MΩ min. 100V DC	100MΩ min. 100V DC	100MΩ min. 100V DC	100MΩ min. 500V DC	100MΩ min. 500V DC	100MΩ min. 500V DC
	Voltage proof	100V AC for 1minute					250V AC for 1minute	500V AC for 1minute	100V AC for 1minute	100V AC for 1minute	100V AC for 1minute	500V AC for 1minute	500V AC for 1minute	500V AC for 1minute
	Terminal strength	0.5N for 1minute	3N for 1minute	0.5N for 1minute	0.5N for 1minute	0.5N for 1minute	0.5N for 1minute	0.5N for 1minute	1N for 1minute	1N for 1minute	1N for 1minute	3N for 1minute	3N for 1minute	3N for 1minute
	Actuator strength	5N	10N	5N	10N	10N	20N	20N	5N	5N	5N	20N	20N	10N
	Vibration	10 to 55 to 10Hz/min., the amplitude is 1.5mm for all the frequencies, in the 3 direction of X, Y and Z for 2 hours respectively												
	Manual soldering	350±5°C, 3s max.	300 ±10°C, 3 ⁺¹ ₋₀ s	350±5°C, 3s max.	350±5°C, 3s max.	350±5°C, 3s max.	350±5°C, 3s max.	350±5°C, 3s max.	350±5°C, 3s max.	350±5°C, 3s max.	350±5°C, 3s max.	300±10°C, 3 ⁺¹ ₋₀ s	300±10°C, 3 ⁺¹ ₋₀ s	300±10°C, 3 ⁺¹ ₋₀ s
	Dip soldering		260±5°C, 3s max.	260±5°C, 3s max.	260±5°C, 3s max.	260±5°C, 3s max.	260±5°C, 3s max.	260±5°C, 3s max.	260±5°C, 3s max.	260±5°C, 3s max.	260±5°C, 3s max.	260±5°C, 3s max.	260±5°C, 3s max.	260±5°C, 3s max.
	Reflow soldering	Please see P.70	—	Please see P.70	Please see P.70	Please see P.70	—	—	Please see P.70	Please see P.70	Please see P.70	—	—	—
Durability	Operating life without load	50,000 cycles 10 Ω max.	25,000 cycles 2 Ω max.	50,000 cycles 5 Ω max.	100,000 cycles 1 Ω max.	100,000 cycles 1 Ω max.	300,000 cycles 1 Ω max.	50,000 cycles 5 Ω max.	300,000 cycles 1 Ω max.	300,000 cycles 1 Ω max.	300,000 cycles 1 Ω max.	300,000 cycles 1 Ω max.	300,000 cycles 1 Ω max.	100,000 cycles 1 Ω max.
	Operating life with load	(1mA 5V DC) 50,000cycles 10 Ω max.	(10mA 16V DC) 25,000cycles 2 Ω max.	(1mA 5V DC) 50,000cycles 5 Ω max.	(50mA 20V DC) 100,000cycles 1 Ω max.	(0.1A 12V DC) 100,000cycles 1 Ω max.	(0.1A 12V DC) 300,000cycles 1 Ω max.	(1mA 5V DC) 50,000cycles 5 Ω max.	(0.1A 12V DC) 300,000cycles 1 Ω max.	(0.1A 12V DC) 300,000cycles 1 Ω max.	(0.1A 12V DC) 300,000cycles 1 Ω max.	(0.1A 12V DC) 300,000cycles 1 Ω max.	(0.1A 12V DC) 300,000cycles 1 Ω max.	(0.1A 12V DC) 100,000cycles 1 Ω max.
Environmental performance	Cold	-20±2°C for 96h				-40±2°C for 96h	-40±2°C for 500h	-40±2°C for 500h	-20±2°C for 96h	-40±2°C for 500h				
	Dry heat	85±2°C for 96h					85±2°C for 500h	85±2°C for 500h	85±2°C for 96h	85±2°C for 500h				
	Damp heat	40±2°C, 90 to 95%RH for 96h					60±2°C, 90 to 95%RH for 500h	60±2°C, 90 to 95%RH for 500h	40±2°C, 90 to 95%RH for 96h	60±2°C, 90 to 95%RH for 500h				

Soldering Conditions

Example of Reflow Soldering Condition

1. Heating method: Double heating method with infrared heater.
2. Temperature measurement: Thermocouple 0.1 to 0.2 ϕ CA (K) or CC (T) at soldering portion (copper foil surface) . A heat resisting tape should be used for fixed measurement.
3. Temperature profile



Series (Reflow type)	A (°C) 3s max.	B (°C)	C (s)	D (°C)	E (°C)	F (s)
SPPB	250	230	40			
SPPW8		200	20			
SPVE	260	230	40	180	150	120
SPVG						
SPVL						
SPVM						
SPVN						
SPVP						
SPVR						
SPVS						
SSCM						
SPPY5	240		20	150	Room Temperature	180

Notes

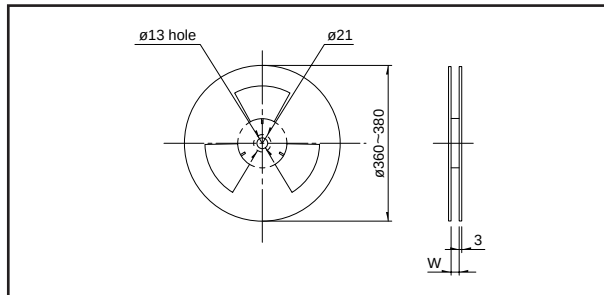
1. The condition mentioned above is the temperature on the mounting surface of a PC board. There are cases where the PC board's temperature greatly differs from that of the switch, depending on the PC board's material, size, thickness, etc. The above-stated conditions shall also apply to switch surface temperatures.
2. Soldering conditions differ depending on reflow soldering machines. Prior verification of soldering condition is highly recommended.

Taping Specifications

Taping Packaging

Reel Size

Unit:mm



Series			Number of packages (pcs.)			Reel width W (mm)	Tape width (mm)
			1 reel	1 case (shipment within Japan)	1 case (shipment outside of Japan)		
SPPB	53 (Horizontal)		1,500	3,000	6,000	24.4	24
	53 (Vertical)		600	1,200	2,400		
	63, 64		1,300	2,600	5,200		
SPPW81	h = 6.1 (Reflow)		1,000	2,000	4,000		
	h = 6.55 (Reflow)						
	h = 7.6 (Reflow)		850	1,700	3,400		
SPVE	Standard	h=3.8	2,800	5,600	22,400	12.4	12
		h=4.1					
		h=4.8	2,200	4,400	17,600		
		h=5.2	2,000	4,000	16,000		
		h=5.5					
	Low-profile	h=3.3	2,800	5,600	22,400		
SPVG			2,500	5,000	10,000	16.4	16
SPVL			5,000	10,000	20,000		
SPVM			3,000	6,000	12,000		
SPVN			5,000	10,000	20,000		
SPVP			4,500	9,000	18,000		
SPVR			2,500	5,000	10,000		
SPVS			5,000	10,000	20,000		
SSCM			3,000	6,000	12,000		
SPPY5			550	1,650	3,300	44.4	44

Note

Please place purchase orders for taping products per minimum package units (1 reel or 1 case).

Detector

Push

Slide

Rotary

Encoders

Power

Dual-in-line
Package Type

Multi Control
Devices

TACT Switch™

Custom-
Products